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PATENT CLAIMS:

Claims 1-32: Canceled

33. (New) A method for the control of digitally and analogically adjustable shock absorbers, where the shock absorbers are controlled according to the situation by means of a control signal such that the road performance of the vehicle is improved when understeering or oversteering occurs, comprising the steps of

- determining phase magnitudes,
- calculating the phases of the control signals from the phase magnitudes, and,
- in the case of a driving situation with a tendency to sway, determining a moment in time as a function of at least the magnitudes which describe the rotation of the vehicle about the vertical axis, when a correct phase control of the shock absorbers of the vehicle is carried out to increase the steerability when understeering occurs and to increase the driving stability when oversteering occurs.

34. (New) The method according to claim 33, wherein a correct phase control occurs as a function of the yaw rate and at least one derivative of the yaw rate.

35. (New) The method according to claim 33, additonally including the steps of

- determining a reference yaw rate based on a model calculation;
- measuring the actual yaw rate of the vehicle;
- determing the difference between the reference yaw rate and the measured yaw rate;
- determining the difference between the gradients of the two yaw rates, i.e. between the reference yaw acceleration and the actual yaw acceleration of the vehicle, and
- determining, from the differences of the yaw-related quantities, accurate phase switching moments in time, between which the shock absorbers of the wheels can be adjusted.

36. (New) The method according to claim 35, wherein the reference yaw rate is determined in a linear single-track model.

37. (New) The method according to claim 33, wherein the control concept is a part of an ESP control strategy, and signals from the ESP control are processed for carrying out the method.

38. (New) The method according to claim 33, wherein an understeering behavior in the left curve is recognized if the condition $\dot{\psi}_{ref} > \dot{\psi} + \varepsilon_1$ and $\ddot{\psi}_{ref} > \ddot{\psi} + \varepsilon_2$ is satisfied, and wherein an understeering behavior in the right curve is recognized if the condition $\dot{\psi}_{ref} < \dot{\psi} - \varepsilon_1$ and $\ddot{\psi}_{ref} < \ddot{\psi} - \varepsilon_2$ is satisfied, and wherein, if an understeering behavior is recognized in any of the two directions, the shock absorbers of the fronts wheels are softened and those of the back wheels are hardened to incraase steerability.

39. (New) The method according to claim 33, wherein an oversteering behavior in left curve is recognized if the condition $\ddot{\psi}_{ref} \leq \ddot{\psi}$ and $\ddot{\psi} > \varepsilon_3$ is satisfied, and wherein an oversteering behavior in right curve is recognized if the condition $\ddot{\psi}_{ref} \geq \ddot{\psi}$ and $\ddot{\psi} < -\varepsilon_3$ is satisfied, and wherein, if an oversteering behavior is recognized in any of the two directions, the shock absorbers of the front wheels are hardened and those of the back wheels are softened to increase stability.

40. (New) The method according to claim 33, wherein a neutral behavior of the vehicle is recognized in any of the following instances:

- after an understeering behavior occurred, the condition $|\dot{\psi}_{ref} - \dot{\psi}| < \varepsilon_1$ and $|\ddot{\psi}_{ref} - \ddot{\psi}| < \varepsilon_2$ is satisfied,
- after oversteering occurred, the condition $-\varepsilon_3 \leq \ddot{\psi} \leq \varepsilon_3$ is satisfied,
- after the occurrence of an uncritical behavior, the condition $|\dot{\psi}_{ref} - \dot{\psi}| < \varepsilon_1$ and $|\ddot{\psi}_{ref} - \ddot{\psi}| < \varepsilon_2$ and $|a_y| > \varepsilon_4$ is satisfied;

and wherein, if a neutral behavior is recognized, the shock absorbers of the front

wheels and the back wheels are all switched to medium to high damping.

41. (New) The method according to claim 33, wherein an uncritical road performance is recognized after the occurrence of a neutral behavior, because the condition $|\dot{\psi}_{ref} - \dot{\psi}| < \varepsilon_1$ and $|\ddot{\psi}_{ref} - \ddot{\psi}| < \varepsilon_2$ and $|a_y| < \varepsilon_5$ is satisfied, and wherein, if an uncritical behavior is recognized, the shock absorbers are again switched to the state which corresponds to the standard control strategy used.

42. (New) The method according to claim 33, wherein the stiffness of the shock absorbers is adjusted continuously, where the amount of damping depends on the prevalent driving situation.

43. (New) The method according to claim 33, wherein the stiffness of the shock absorbers is adjusted and depends on the dynamics of the given driving situation, and wherein the dynamics of movement is evaluated considering at least one member of the group consisting of the following quantities:
the actual yaw rate of the vehicle, the actual yaw acceleration of the vehicle, the reference yaw rate, the reference yaw acceleration, and the lateral acceleration of the vehicle.

44. (New) The method according to claim 43, wherein the quantities considered for the evaluation of the dynamics of movement are weighted using the longitudinal speed of the vehicle.

45. (New) The method according to claim 43, wherein for the evaluation of the dynamics of movement not only the currently measured or calculated dynamics of movement signals at a certain time is considered, but also the course of these signals within a past time interval ...delta_T..., where the maximum values of the signals are stored and they are unlearned over the course of time by linear or degressive reduction.

46. (New) The method according to claim 33, wherein the control of the shock absorbers

with the phase-correct control signal is superposed by addition over the requirements of additional shock absorber control mechanisms.

47. (New) The method according to claim 46, wherein the amount of the additive superposition of different requirements for the shock absorbers is established by the reached amount of the dynamics of movement and, in the case of high dynamics of movement, a high proportion of up to 100% is requested, while, in the case of lower dynamics of movement, only a small portion of as little as 0% is requested and superposed over a correspondingly large portion of an additional control strategy.

48. (New) The method according to claim 33, wherein thresholds ε are adapted, for the determination of the driving situation, to reaction times due to the data transfer between the controller and the shock absorbers, and the delay times are adapted to the shock absorbers, where, in the case of a larger sum of reaction time and delay time, smaller thresholds are used so that the switching reaction occurs on time.

49. (New) A device for the control of digitally or analogically adjustable shock absorbers, where the shock absorbers are controlled according to the situation in such a manner that the road performance of the vehicle is improved when understeering or oversteering occurs, comprising a determination unit (200) for the determination of phase magnitudes, for which the phases of the control signals are calculated, an additional determination unit (230) for the determination of a driving situation with a tendency to sway and a regulation and control unit (220, 210), and which device, as a function of at least the magnitudes, describes the rotation of the vehicle about the vertical axis and determines a moment in time at which a correct phase control of the shock absorbers of the vehicle is carried out to increase the steerability when understeering occurs and the driving stability when oversteering occurs.

50. (New) The device according to claim 49, wherein the determination unit (200) determines the deviation between the reference yaw rate which has been determined according to a linear single-track model and the actually measured yaw rate of the vehicle as well as the difference between the gradients of the two yaw rates, that is

the reference yaw acceleration and the actual yaw acceleration of the vehicle, and wherein the control unit (220, 210), with inclusion of the determination unit (230), determines phase-accurate switching moments in time from the yaw magnitudes, between which moments in time the shock absorbers of the wheels are switched to hard or soft in steps or continuously.

51. (New) The device according to claim 49, wherein the control concept is part of an ESP control strategy and includes the signals of the ESP control in the control and/or control of the shock absorbers.

52. (New) The device according to claim 49, wherein the determination unit (230) recognizes an understeering behavior in the left curve if the condition $\dot{\psi}_{ref} > \dot{\psi} + \varepsilon_1$ and $\ddot{\psi}_{ref} > \ddot{\psi} + \varepsilon_2$ is satisfied, and an understeering behavior in the right curve if the condition $\dot{\psi}_{ref} < \dot{\psi} - \varepsilon_1$ and $\ddot{\psi}_{ref} < \ddot{\psi} - \varepsilon_2$, and wherein, if understeering behavior is recognized in any of the two directions, the determination unit (230) generates a signal which is used to switch the shock absorbers of the front wheels to soft and those of the back wheels to hard.

53. (New) The device according to claim 49, wherein the determination unit (230) recognizes an oversteering behavior in a left curve if the condition $\ddot{\psi}_{ref} \le \ddot{\psi}$ und $\ddot{\psi} > \varepsilon_3$ is satisfied, and an oversteering behavior in a right curve if the condition $\ddot{\psi}_{ref} \ge \ddot{\psi}$ and $\ddot{\psi} < -\varepsilon_3$ is satisfied, and wherein, if oversteering behavior is recognized in any of the two directions, the determination unit (230) generates a signal which is used to switch the shock absorbers of the front wheels to hard and those of the back wheels to soft.

54. (New) The device according to claims 49, wherein the determination unit (230) recognizes a neutral behavior of the vehicle if, after the occurrence of an understeering behavior, the condition $\left|\dot{\psi}_{ref} - \dot{\psi}\right| < \varepsilon_1$ und $\left|\ddot{\psi}_{ref} - \ddot{\psi}\right| < \varepsilon_2$ is satisfied, or if, after the occurrence of an oversteering behavior, the condition $-\varepsilon_3 \le \ddot{\psi} \le \varepsilon_3$ is satisfied, or if, after the occurrence of an uncritical behavior, the conditions

$|\dot{\psi}_{ref} - \dot{\psi}| < \varepsilon_1$ and $|\ddot{\psi}_{ref} - \ddot{\psi}| < \varepsilon_2$ and $|a_y| > \varepsilon_4$ are satisfied, and wherein, if neutral behavior is recognized, the determination unit (230) generates a signal which is used to switch the shock absorbers of the front wheels and back wheels equally to medium to high damping.

55. (New) The device according to claim 49, wherein the determination unit (230) recognizes an uncritical road performance after the occurrence of a neutral behavior if the condition $|\dot{\psi}_{ref} - \dot{\psi}| < \varepsilon_1$ and $|\ddot{\psi}_{ref} - \ddot{\psi}| < \varepsilon_2$ and $|a_y| < \varepsilon_5$ is satisfied, and wherein, if uncritical behavior is recognized, the determination unit generates a signal which is used to switch the shock absorbers back to the state which corresponds to a standard control strategy used.

56. (New) The device according to claim 49, wherein the control unit (220, 210) does not adjust the damping of the shock absorbers only in the discreet steps soft, medium, hard, but continuously, where the amount of damping depends on the given driving situation.

57. (New) The device according to claim 49, wherein the control unit (220, 210) determines the amount of the continuously adjusted damping from the dynamics of the given driving situation, where, as relevant signals for the evaluation of the dynamics of movement, at least one of the members of the group consisting of the following quantities is considered:
The actual yaw rate, the actual yaw acceleration of the vehicle, the reference yaw rate the reference yaw acceleration, the lateral acceleration of the vehicle.

58. (New) The device according to claim 49, wherein the values of the signals which are used for the evaluation of the dynamics of movement are weighted by means of the longitudinal speed of the vehicle.

59. (New) The device according to claim 49, wherein, for the evaluation of the dynamics of movement, one uses not only the currently measured or calculated dynamics of

movement signals at a moment in time, but also the course of the signals within a past time interval ...delta_T..., where the maximum values of the signals are stored and they are unlearned by linear or degressive reduction over time.

60. (New) The device according to claim 49, wherein the control of the shock absorbers is superposed additively over the requirements of other shock absorber control mechanisms.

61. (New) The device according to claim 60, wherein the amount of the additive superposition of different requirements for the shock absorbers is determined by the reached amount of the dynamics of movement, and wherein, in the case of high dynamics of movement, a high proportion of up to 100% is requested, while, in the case of lower dynamics of movement, only a small proportion as low as 0% is requested and superposed over an accordingly high proportion of another control strategy.

62. (New) The device according to claim 49, wherein for the determination of the road situation threasholds are sset and adapted to reaction times due to data transfer between the controller and the shock absorbers as well as to the delay times of the adjustment elements, where smaller thresholds are used in the case of a larger sum of reaction time and delay time so that the switching reaction occurs on time.

63 (New) A vehicular ESP controller comprising a device for the control of adjustable shock absorbers, where the shock absorbers are controlled according to the situation in such a manner that the road performance of the vehicle is improved when understeering or oversteering occurs, the device comprising a determination unit (200) for the determination of phase magnitudes, for which the phases of control signals are calculated, an additional determination unit (230) for the determination of a driving situation with a tendency to sway and a regulation and control unit (220, 210), and which device, as a function of at least the magnitudes, describes the rotation of the vehicle about the vertical axis and determines a moment in time at which a correct phase control of the shock absorbers of the vehicle is carried out to

increase the steerability when understeering occurs and the driving stability when oversteering occurs.